QUALITY ASSURANCE PROJECT PLAN (QAPP)
DRAFT

FOR THE

DRINKING WATER SAMPLING AT THE PARK PLACE BUILDING

May 20, 2014

Prepared by EPA Region 10 Quality Staff

QAPP APPROVAL:

_____ **Date:**_____
Joyce Kelly, Director, USEPA Region 10
Office of Environmental Assessment

_____ **Date:**_____
Mark Filippini, Unit Manager, USEPA Region 10
Environmental Services Unit, Office of Environmental Assessment

_____ **Date:**_____
Ginna Grepo-Grove, QA Manager, USEPA Region 10
Office of Environmental Assessment

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1.0 Project Management

1.1 Distribution List

Copies of the completed/signed project plan should be distributed to:

Name	Title	Mail Stop	Phone Number	e-Mail Address
Mark Filippini	ESU Unit Manager	OEA-095	(206) 553-6327	Filippini.Mark@epa.gov
Jennifer Crawford	RSCC	OEA-095	(206) 553-6261	Crawford.Jennifer@epa.gov
Don Matheny	QA Officer	OEA-095	(206) 553-2599	Matheny.Don@epa.gov
Gerald Dodo	Supervisor (Chemistry)	LAB	(360) 871-8728	Dodo.Gerald@epa.gov

A summary of analytical results along with a data verification summary (QC review) shall be sent to the Unit Manager for the Environmental Services Unit (ESU) located in the Office of Environmental Assessment (OEA). Electronic copies of data are not required unless specifically requested.

1.2 Project/ Task Organization

This section identifies the personnel involved in the sampling and analytical activities and defines their respective roles and responsibilities in the process.

1. ESU Unit Manager

The ESU Unit Manager (UM) leads the sampling activity on behalf of the Region's Health & Safety Program. The ESU UM's responsibility is to prepare a final report based on the results of the sample analytical data obtained from the laboratory. In conjunction with the sampling, the UM shall also be responsible for:

- Sample collection and the recording of any observations (i.e., field log);
- Coordination with building management;
- Coordinating with the Regional Sample Control Center (RSCC) for a regional project code and sample identification numbers
- Coordinating with EPA sampling team members;
- Maintaining sample documentation, including chain of custody, photographs, and receiving sample analytical results.

2. Regional Sample Control Center (RSCC)

The EPA Region 10 RSCC is located within the Office of Environmental Assessment (OEA). The role of the RSCC is to:

- coordinate support with the EPA Region 10 Manchester Environmental Laboratory (MEL)
- schedule sample deliveries and timeframes with MEL,
- provide Regional sample ID numbers, Project Codes and Account Numbers
- Manage the Scribe project file

3. *Quality Assurance Officer (QAO)*

The QAO is part of the Quality Staff and is located in the ESU. The QAO is authorized by the Regional QA Manager (RQAM) to act as his/her designee. The QAO reviews / approves the final QAPP and acts as the alternate RSCC.

4. *Analytical Laboratory- Manchester Environmental Laboratory (MEL) or Contract Lab*

MEL is the USEPA Region 10 Environmental Laboratory. The Lab's physical address is:

7411 Beach Drive E,
Port Orchard, WA 98366

For these inspections, MEL (or a contract lab) is responsible for the following tasks:

- providing "certified clean" sample containers and preservatives,
- performing analysis of samples,
- data generation, reduction, review and verification
- submission of analytical results, data print-outs (if requested) and QC summary results

1.3 Problem Definition/ Background

1.3.1 Background

The renovation of EPA occupied space within the Park Place Building, located in Seattle, Washington has raised concerns among the EPA Region 10 management regarding the concentration of lead in the building's drinking water lines above the MCL of 15 µg/L. In response to these concerns, sample collection of the drinking water supply is planned for all remaining locations where water ingestion is anticipated that have not been recently sampled by the building's management company. In addition, the samples will be analyzed for copper as bluegreen staining has been noted on several water fountains.

1.3.2 Objectives/Scope

The objective of this study is to perform a one-time determination of lead and copper concentrations in the drinking water for specific floors & locations in EPA occupied space within the Park Place Building (Seattle, Washington). The scope will involve the collection first draw drinking water, not used during the previous 8-hours, from specific areas of the building that have not been recently sampled by building management. The approach will generally follow the EPA guidance for sampling for lead in drinking water sources in schools and daycare centers (EPA.gov). These samples will be shipped to the EPA Manchester Environmental Laboratory (MEL) for the analysis of Lead and Copper utilizing an EPA drinking water certified method. Upon receipt of reviewed data, a report on the concentration of lead and copper in these samples will be provided to EPA Region 10 senior management and staff.

1.4 Project/ Task Description and Schedule

1.4.1 Project/Task Description

This QAPP was developed for the purpose of supporting the sampling and analysis of drinking waters collected from the Park Place Building. Samples will be analyzed by the EPA Manchester Environmental Laboratory (NELAP accredited & Drinking Water Certified). All of the analyses will be performed in accordance with the analytical methodologies and QC requirements specified in Table 3 - Data Quality Objectives Summary of this QAPP. See the sample collection section and specific analyses that will be performed.

1.4.2 Schedule of Tasks

Table 1 – Activity Schedule and Tentative Start and Completion Dates

Activity	Estimated Start Date	Estimated Completion Date
Sample Collection	May 28, 2014	May 28, 2014
Data Review/Verification/Reporting data to ESU Unit Manager		3 Weeks after receipt of samples
Target Completion Date		TBD by ESU Unit Manager / Program

1.5 Data Quality Objectives and Criteria for Measurement Data

Data Quality Objectives (DQOs) are the quantitative and qualitative terms ESU Unit Managers and project managers use to describe how good the data needs to be in order to meet the project's objectives. DQOs for measurement data (referred to here as data quality indicators) are precision, accuracy, representativeness, completeness, comparability, sensitivity and measurement range. The overall QA objective for analytical data is to ensure that data of known and acceptable quality are provided. To achieve this goal, data must be reviewed for 1) representativeness, 2) comparability, 3) precision, 4)

accuracy (and bias), 5) completeness and 6) sensitivity. Precision, accuracy, sensitivity, completeness, sample representativeness and data comparability are necessary attributes to ensure that analytical data are reliable, scientifically sound, and legally defensible. Each analytical result or set of results generated should be fully defensible in any legal action, whether administrative, civil, or criminal.

Precision: The precision of each test depends on the combined variability of the analytical method and sample matrix. Regular and/or matrix spike samples in duplicate will be analyzed on a 10 % frequency (1 per 10 samples collected). The precision is evaluated using the Relative Percent Difference (RPD) values between the duplicate sample results.

Accuracy: Accuracy and bias will be evaluated by the use percent recovery (%R) of the target analyte in spiked samples and also the recoveries of the surrogates in all samples and QC samples.

$$\% \text{ Recovery} = \frac{SQ - NQ}{S} \times 100$$

SQ = quantity of spike or surrogate found in sample
NQ = quantity found in native (un-spiked) sample
S = quantity of spike or surrogate added to native sample

Representativeness is the degree to which data from the project accurately represent a particular characteristic of the environmental matrix which is being tested. Samples will represent first and second draw drinking water samples from the locations identified in Table 4 and following the sampling protocols identified in Section 2 of this QAPP.

Comparability is the measurement of the confidence in comparing the results of one sampling event with the results of another achieved by using the same matrix, sample location, sampling techniques and analytical methodologies.

Completeness: Completeness is the percentage of valid results obtained compared to the total number of samples taken for a parameter. Since the sampling for this project is a one-time grab and limited in number of samples, the number of valid results obtained from the analyses are expected to be equal or better than 95%. Percent completeness may be calculated using the following formula:

$$\% \text{ Completeness} = \frac{\text{\# of valid results}}{\text{\# of samples taken}} \times 100$$

Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest. For this project, reporting limits represent the lowest concentration for demonstrated instrument quantitation. Laboratory measurements will have the required reporting limits identified in Table 3.

The QA objectives outlined, above, will be evaluated in conjunction with the data validation process.

1.6 Special Training Requirements/Certification

Samplers are required to complete the 24-hour Basic Health and Safety training. The sampler(s) will obtain a basic health and safety training certification from the 24-hour training which should be maintained current by attending an 8-hour safety training refresher course every year. Samplers will also have experience in the collection of drinking water samples and be familiar with the requirements of this QAPP. Sampling teams will be specifically briefed on the procedures to be followed on the day of sampling to assure adherence to the objectives are met.

The laboratory performing the sample analysis for this program are NELAP accredited and drinking water certified. Chemists performing the analytical work for this project have extensive knowledge, skill and demonstrated experience in the execution of the analytical methods being requested.

1.7 Documentation and Records

Complete documentation for this project may include but is not limited to the following forms, which have to be completed and collated by the EPA ESU Unit Manager:

- Project Report
- Chain of Custody Logs
- Record of Sampling
- Laboratory Analysis Reports
- Photographs, Sketches, Paper Copies, or other documentation.

Samplers will maintain field notes in a bound notebook and all documents, records, and data collected will be kept in a case file and submitted to the program office with the final report.

The following documents will be archived at the Manchester Environmental Laboratory or the designated laboratory performing the analysis: (1) signed hard copies of sampling and chain-of-custody records (2) electronic and hard copy of analytical data including extraction and sample preparation bench sheets, raw data and reduced analytical data.

The laboratory will store the above records, data, and other analytical documentation as per their established SOP.

2.0 Measurement/ Data Acquisition

2.1 Sampling Process Design (Experimental Design)

Sample collection will follow the same approach used previously by the Building (EPA 812-B-94-002) to test the water in renovated floors and will follow the most current guidance for childcare facilities (EPA 816-R-05-009). Prior to sample collection, signs will be posted at the sampling locations stating:

"Water Testing is Being Conducted. Please do not use the Water" (or similar). The signs will be posted no later than 10:00 pm the night prior to the sampling. Sampled fixtures must not be used for at least 8 hours prior to sampling. EPA will coordinate with the building management and staff to assure overnight staff heed the instructions. These signs will be posted on every drinking fountain and kitchen sink for the sampled floors. An Info Page announcement and all-staff email may also be used to remind staff to not use the fixtures.

Sampling teams will be deployed by 6:00 am the day of sampling to collect samples prior to staff arriving that morning for work to minimize disruption. Two 3-person sampling teams are expected to be deployed and complete sample collection within one hour. A minimum of two persons may be used for sampling teams if necessary. Samples will be collected into 250 ml plastic bottles supplied by the laboratory.

2.2 Field and Sample Collection Procedures

2.2.1 Health and Safety

Safety considerations regarding the collection and handling of water samples apply.

2.2.2 Locations

Sample locations will represent the cold water from kitchen faucets, drinking fountains, and ice from the refrigerators located on floors 7 through 13 and 18. In addition, the cold water faucet from the sink in Maternal Wellness Center on the 13th floor will also be sampled.

2.2.3 Sample Collection

Sample collection will occur during the early morning hours.

1. Drinking Water Fountains (Bubblers) – Collect the First Draw sample immediately after opening faucet without letting any water run into the drain. Collect the Second Draw sample following a 30-second flush.

2. Sinks - Collect the First Draw sample immediately after opening of the cold-water faucet without letting any water run into the drain. Use a funnel for faucets with sprayers. Collect the Second Draw sample following a 30-second flush.

3. Ice from refrigerators – A one-gallon Ziploc bag will be filled halfway with ice, allowed to melt, then poured into the water sample container. No 'secondary draw' sample will be collected.

For samples collected from sinks and drinking fountains; if there is liquid noted in the basin or drain of the fixture, the sample location will be considered invalid as this would be an indication that the fixture has been used within the 8-hour static period. Such observances will be noted in the field log book and no sample will be collected.

The sample containers should be labeled with:

- Regional Sample Identification Number
- Date & Time of Sample Collection
- Project Code
- Preservative used (or None)
- Type of analysis

Certain floors contain two adjacent drinking fountains located on the south side of the building (pictured below). For the purpose of sample location identification, when facing the fountains, the right fountain is designated "South East" and the left fountain is designated "South West".

South West Fountain **South East Fountain**

Preprinted labels will be used and placed on the bottles prior to sample collection. Hand written information will be entered on each label using an indelible, waterproof ink. Clear packing tape shall be placed over the sample labels after the sample times have been entered. Sample containers will be placed individually in sealed plastic bags and stored in coolers following collection until lab receipt and custody relinquishment is complete. Proper chain of custody procedures must be followed at all times.

2.2.4 Sample Collection Equipment

Equipment needs will vary depending upon conditions. The list in Table 2 (below) provides suggestions to be considered.

Table 2 – Suggested Sample Equipment

General	Safety	Emergency
Field Notebook Camera Pens & Markers Pre-cleaned Funnels Sample Bottles (250 ml plastic) Sample Labels Ziploc Bags Shipping Coolers	Rubber, Latex or Nitrile gloves Soap, towels, and water for washing hands	Phone numbers Cell Phone

2.2.5 Shipping Requirements

All of the samples are hand-delivered to the laboratory analyzing the samples. Samples for laboratory analysis will be hand-delivered to the MEL within the prescribed holding times.

2.2.6 Decontamination Procedures

Samples will be collected directly into sample containers. No decontamination procedures are necessary.

2.3 Analytical Methods Requirements

The measurement parameters for this study are copper and lead. The selected analytical method is EPA 200.8 which is compliant with Safe Drinking Water Act requirements.

2.4 Quality Control Requirements

Quality Control procedures for analyte measurements will be according to the requirements specified in the method that will be used in the analysis.

The collection of a bottle plus preservative blank is required for every 1 in 20 samples collected. The criteria applied for evaluation of these sample results will be identical to that which is identified in the appropriate laboratory SOPs and/or QA Manual. In general, copper and lead results in bottle blanks should be less than the laboratory's reporting limit or ten times below the detected sample concentration. The laboratory will be informed of the bottle blank IDs and evaluate the sample results using the same requirements as a method blank. Bottle blanks will consist of:

- Bottle Blank (2) – represent samples collected directly into bottles
- Bottle/Funnel Blank (1) – represent samples poured through a funnel into bottles
- Ice Bag/Bottle Blank (1) – represent ice samples collected in plastic bags and poured into bottles

2.5 Instrument/Equipment Testing, Inspection and Maintenance Requirements

Field and laboratory personnel will follow their standard operating procedures for any preventative maintenance required on laboratory instruments or systems used for this project. For field instrumentation, a citation of the SOP should be noted in the field logs.

2.6 Instrument Calibration and Frequency

No field measurement equipment will be used for this project. The laboratory will follow the calibration procedures found in the methods listed in Table 3 and/or in the laboratory's SOPs.

2.7 Inspection/Acceptance Requirements for Supplies and Consumables

Sample bottles will be appropriately cleaned as per MEL SOP MIG001A or certified clean from the supplier. Samplers will make note of the information on the certificate of analysis that accompanies bottles to ensure that they meet the specifications for contaminant free containers.

2.8 Data Acquisition Requirements (non-Direct Measurements)

All monitoring data collected under this QAPP will be primary data (collected by EPA). No secondary (existing) monitoring data will be acquired for this project.

2.9 Data Management

Information collected in field notebooks and photos may be taken. Scribe will be used to manage field sample locations, sample IDs, dates and times. Sample labels and Chain of Custody Data forms will be pre-printed from Scribe and the sample times filled in by sample team members. The following Location Codes and valid values will be used to identify each sample location:

Location Code: "Floor Number" – "Fixture Type" - "Building Side" (drinking fountains only)

- Floor Numbers: 7 – 13, 18
- Fixture Types: DF (drinking fountain), SINK (sink faucet), RFICE (refrigerator ice)
- Building Side: N (north), S (south), SE (southeast), SW (southwest)

Example Location Code: 10-DF-N (10^{th} floor drinking fountain on the north side of the building)

The Chain of Custody Data Sheets will have the following information:

- Project Name
- Project Code
- Regional Sample Identification Number
- Date & Time of Sample Collection
- Sampler's name & initials
- Sample Location Code

Information identifying bottle / preservative blanks and samples designated for Lab QC will be provided on the chain of custody sheets for the lab.

The final report will be completed within a timeframe agreed to between the ESU Unit Manager and Senior Management. Validated laboratory results and interpretation (if necessary) will be appended. Photographs of sample locations may be used to illustrate conditions (e.g., staining) observed in the data.

All laboratory analytical data generated in support of this project will be processed, stored, and distributed according to laboratory's SOPs.

3.0 Assessment/Oversight

3.1 Assessments and Response Actions

The ESU Unit Manager will be responsible for reviewing field log notebooks for accuracy and completeness after sample collection. Sample results provided to the ESU Unit Manager by the laboratory will be appended to the report. The ESU Unit Manager will compare the sample information in the field log notebooks with the analytical results appended to the report to ensure that no transcriptions errors have occurred.

The laboratory routinely performs performance checks using different program specific quarterly blind and check standards. Each method of analysis requires specific QA/QC runs that must be complied with by the laboratory performing the analysis. An internal review and verification of the data and results are also routinely conducted by the appropriate supervisors and the Laboratory QA Coordinator. No additional audits will be performed on the laboratory for this project.

Corrective action procedures that might be implemented from QA results or detection of unacceptable data will be developed if required and documented in Attachment 2.

3.2 Reports to Management

Only the data review & verification reports with the properly qualified data shall be provided by the laboratory to the ESU Unit Manager. If, for any reason, the schedules or procedures above cannot be followed, the EPA ESU Unit Manager must complete the Attachment 1- Sample Alteration Form (SAF). The SAF should be reviewed and approved by the QAO. The laboratory should be given a copy of the QAO approved SAF for reference and project file.

4.0 Data Validation and Usability

4.1 Data Review, Validation, and Verification Requirements

The criteria for the validation will follow those specified in this QA plan and the criteria specified in the methods.

4.2 Validation and Verification Methods

All data generated shall be reviewed and verified in accordance with the QA/QC requirements specified in the method, and the technical specifications outlined in the QAPP. The summary of all analytical results will be reported to the EPA ESU Unit Manager. The raw data for this project shall be maintained by the laboratory. Data review will be performed by the laboratory for all the analyses prior to the release of data (which will occur approximately 8 weeks after receipt of samples). The laboratory will also archive the analytical data into their laboratory data management system.

4.3 Reconciliation with User Requirements

All data and related information obtained during the course of this project will be included in a data report package.

Table 3 – Park Place Drinking Water QAPP Analytical Data Quality Objectives Summary

Analytical Group	Number of Samples[1]	# of Field QA Samples: Bottle Blanks (1/20)	Lab QC DU/MS/MSD Samples (10% or 1/10 samples)	Matrix	Method	Method Reporting Limits (Sensitivity)	Accuracy	Precision (RPD)	Complete-ness	Preservation[2]	Volume, Container	Holding Time (days)
Laboratory Measurements												
Total Lead Total Copper	72	4	Y	water	200.8	Lead 0.5 ug/L Copper 2.0 ug/L	75-125%	± 20RPD	100%	HNO3 to pH < 2	250 ml Plastic	180 days

*All samples must be collected as grabs.
[1] - Sample number includes QA samples and Matrix Spike / Matrix Spike Duplicate (MS/MSD).
[2] – Acidification of samples (pH<2) will be performed at the Lab and held for a minimum of 16 hours prior to sub-sampling.

Table 4 – List of Sample Locations

Floor 7 Drinking Fountain North
Floor 7 Drinking Fountain South
Floor 7 Kitchen Sink
Floor 7 Refrigerator Ice Maker
Floor 8 Drinking Fountain North
Floor 8 Drinking Fountain SE (RIGHT)
Floor 8 Drinking Fountain SW (LEFT)
Floor 8 Kitchen Sink
Floor 8 Refrigerator Ice Maker
Floor 9 Drinking Fountain North
Floor 9 Drinking Fountain SE (RIGHT)
Floor 9 Drinking Fountain SW (LEFT)
Floor 9 Kitchen Sink
Floor 9 Refrigerator Ice Tray
Floor 10 Drinking Fountain North
Floor 10 Drinking Fountain South
Floor 10 Kitchen Sink
Floor 10 Refrigerator Ice Maker
Floor 11 Drinking Fountain North
Floor 11 Drinking Fountain SE (RIGHT)
Floor 11 Drinking Fountain SW (LEFT)
Floor 11 Kitchen Sink
Floor 11 Refrigerator Ice Maker
Floor 12 Drinking Fountain North
Floor 12 Drinking Fountain SE (RIGHT)
Floor 12 Drinking Fountain SW (LEFT)
Floor 12 Kitchen Sink
Floor 12 Refrigerator Ice Maker
Floor 13 Drinking Fountain North
Floor 13 Drinking Fountain SE (RIGHT)
Floor 13 Drinking Fountain SW (LEFT)
Floor 13 Kitchen Sink
Floor 13 Maternal Wellness Center Room Sink
Floor 13 Refrigerator Ice Maker
Floor 18 Drinking Fountain
Floor 18 Kitchen Sink
Floor 18 Refrigerator Ice Maker

Attachment 1 - Sample Alteration Form

Project Name and Number: _____
Sample Matrix: _____
Measurement Parameter: _____

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

_____
_____

Reason for Change in Field Procedure or Analysis Variation:

_____
_____

Variation from Field or Analytical Procedure:

_____
_____

Special Equipment, Materials or Personnel Required:

_____
_____
_____
_____

Initiators Name: _____ Date: _____

ESU Unit Manager: _____ Date: _____

Quality Staff: _____ Date: _____

Attachment 2 - Corrective Action Form

Project Name and Number: _____

Sample Dates Involved: _____

Measurement Parameter: _____

Acceptable Data Range: _____

Problem Areas Requiring Corrective Action: _____
_____
_____
_____

Measures Required to Correct Problem(s): _____
_____
_____
_____

Means of Detecting Problems and Verifying Correction: _____
_____
_____
_____

Initiators Name: _____ Date: _____

ESU Unit Manager: _____ Date: _____

Quality Staff: _____ Date: _____